



1rL10175

REPORT FOR

ARTIFICIAL LIGHTING IMPACT ASSESSMENT

AT

**BERKSHIRE COUNTY SPORTS CLUB, SONNING LANE, SONNING,
READING RG4 6ST**

PREPARED FOR

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Date

20th December 2024

QUALITY ASSURANCE

Issue / Revision	Issue	Revision 1	Revision 2
Remarks			
Date	20 th December 2024		
Prepared By	Lewis Ellison		
Job Title	Technical Director		
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Project Number	1rL10175		

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EXECUTIVE SUMMARY

PEC were commissioned by PadelStars Ltd to undertake an Artificial Lighting Impact Assessment in support of the proposed sports pitches at Berkshire County Sports Club, Sonning Lane, Sonning, Reading RG4 6ST.

The proposals comprise 3 covered padel courts and 3 outdoor tennis courts alongside associated artificial lighting.

As part of the proposed development a number of artificial lights will be installed across the site to adequately illuminate the sports courts. Subsequently, there is potential for the proposals to cause impacts at nearby sensitive receptors as a result of the proposed artificial lighting. An Artificial Lighting Impact Assessment is therefore required in order to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development.

Modelling was undertaken in order to predict impacts associated with changes in lighting levels at sensitive locations across the site.

The modelling results indicated that lighting levels at sensitive residential receptors remained below pre-curfew limits and as such are not considered to result in a significant impact on nearby residential units. In addition, the design of the lighting includes best practice measures to minimise impacts from light spill and intensity on the surrounding area which has the potential to support the local ecosystem. The location is therefore considered suitable with the inclusion of best practice design measures to protect nearby residential and ecological receptors from artificial lighting impacts.

Based on the assessment results, artificial lighting is not considered a constraint to planning consent for the proposed development.

1 INTRODUCTION

1.1 BACKGROUND

Planning and Environmental Consultants (PEC) Ltd have been commissioned by PadelStars Ltd, hereafter referred to as “the Client” to undertake an Artificial Lighting Assessment in support of a planning application for the proposed sports pitches at Berkshire County Sports Club, Sonning Lane, Sonning, Reading RG4 6ST, herein after referred to as the “Proposed Development”.

1.2 SITE LOCATION AND CONTEXT

The Proposed Development is located at Berkshire County Sports Club, at approximate National Grid Reference (NGR) 475670, 175020. Reference should be made to Figure 1 within Appendix I for a location plan.

The proposals comprise the instalment of 3 covered padel courts and 3 outdoor tennis courts alongside associated artificial lighting. As part of the proposal, a number of artificial lights will be introduced in close proximity to a number of existing residential sensitive receptors. Subsequently, the Proposed Development has the potential to cause impacts at sensitive residential receptor locations as a result of light spill during the operational phase. Following the submission of the planning application to Reading Borough Council (RBC) a Lighting Impact Assessment has been requested to ensure lighting impacts associated with the development remain minimal.

As such a Lighting Impact Assessment is required to determine baseline conditions, assess site suitability for the proposed end use and ensure impacts associated with the proposed development are mitigated or avoided entirely. The assessment will be undertaken in line with the RBC local planning policy and the National Planning Policy Framework (NPPF). This is detailed in the following report.

1.3 LIMITATIONS

This report has been produced in accordance with PEC Ltd standard terms of engagement. This report is solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from PEC Ltd at which point a charge may be levied against such approval.

2 LEGISLATION, GUIDANCE AND POLICY

The following legislation, guidance and policy will be considered and adhered to during the preparation of the Lighting Impact Assessment:

- The National Planning Policy Framework (NPPF), updated on 12th December 2024
- The National Planning Practice Guidance (NPPG), relevant chapters updated on 1st November 2019
- Clean Neighbourhoods and Environmental Act
- Guidance Notes for the Reduction of Obtrusive Light, Institution of Lighting Professionals, 2011
- Lighting in the Countryside: Towards Good Practice, Department for Communities and Local Government, 2005
- Bats and Artificial Lighting in the UK, Institute of Lighting Professionals, BATS Conservation Trust Lighting Guidance, 2008
- Environmental Protection Act, 1990

2.1 LOCAL PLANNING POLICY

The Wokingham Borough Council (WBC) local plan is made up of the of the following documents:

- Core Strategy (adopted 29th January 2010)
- Managing Development Delivery (adopted 21st February 2014)
- Joint Minerals and Waste Plan (adopted 19th January 2023)
- Neighbourhood Development Plans (this site lies within the Thanes Ward and Sonning Civil Parish and subsequently does not have a neighbourhood development plan).

A review of these documents did not reveal any policies in relation to artificial lighting.

“CP1 – Sustainable development

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;*
- 2) Minimise the emission of pollutants into the wider environment;***
- 3) Limit any adverse effects on water quality (including ground water);*
- 4) Ensure the provision of adequate drainage;*
- 5) Minimise the consumption and use of resources and provide for recycling;*
- 6) Incorporate facilities for recycling of water and waste to help reduce per capita water consumption;*
- 7) Avoid areas of best and most versatile agricultural land;*
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;***
- 9) Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater);*
- 10) Provide attractive, functional, accessible, safe, secure and adaptable schemes;*
- 11) Demonstrate how they support opportunities for reducing the need to travel, particularly by private car in line with CP6; and*
- 12) Contribute towards the goal of reaching zero-carbon developments⁴¹ as soon as possible by:*
 - a) Including appropriate on-site renewable energy features; and*
 - b) Minimising energy and water consumption by measures including the use of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate so as to minimise carbon dioxide emissions through giving careful consideration to how all aspects of development form.”*

“CP3 - General Principles for development

Planning permission will be granted for proposals that:

- a) Are of an appropriate scale of activity, mass, layout, built form, height, materials and character to the area together with a high quality of design without detriment to the amenities of adjoining land users including open spaces or occupiers and their quality of life;*
- b) Provide a functional, accessible, safe, secure and adaptable scheme;*

- c) Have no detrimental impact upon important ecological, heritage, landscape (including river valleys) or geological features or water courses.*
- d) Maintain or enhance the ability of the site to support fauna and flora including protected species;*
- e) Use the full potential of the site and contribute to the support for suitable complementary facilities and uses;***
- f) Contribute to a sense of place in the buildings and spaces themselves and in the way they integrate with their surroundings (especially existing dwellings) including the use of appropriate landscaping;*
- g) Provide for a framework of open space in secure community use achieving at least 4.65 ha/1,000 population provision together with recreational/**sporting facilities** in addition to private amenity space;*
- h) Contribute towards the provision of an appropriate sustainable network of community facilities;*
- i) Do not lead to a net loss of dwellings and other residential accommodation or land; and*
- j) Do not lead to a loss of community or recreational facilities/land or infrastructure unless suitable alternative provision is available.*

Development proposals will be required to demonstrate how they have responded to the above criteria through the submission of Design and Access Statements, clear and informative plans, elevations and streetscenes and where required Masterplans, Development Briefs, Concept Statements and Design Codes.”

Reference has been made to this policy by assessing impacts on existing sensitive receptors as a result of the proposals as well as assessing the suitability of the site for the proposed end use.

3 METHODOLOGY

The Artificial Lighting Impact Assessment included the production of a computational model of the development and an evaluation of associated impacts. This included assessment of light trespass at receptor locations.

In order to assess the potential impacts of proposed artificial lighting in the area, a model of assumed lighting design, has been constructed using the Relux Lighting Software (V2025.1.0.0). The calculations performed within the assessment assumed the worst-case effect of the proposed development lighting on existing receptors.

The methodology for each element of the assessment is outlined in the following subsections.

3.1 BASELINE

Existing lighting conditions in the vicinity of the development site were identified in order to provide a reference for assessment. The Lighting in the Countryside¹ document states the following items should be considered during the determination of baseline:

- A review of the area and landscape together with any designations;
- An overview of existing lighting;
- Identification of potential receptors; and
- Environmental Zone Classification.

The ILP has developed an Environmental Zone classification system for the categorisation of assessment locations. This is summarised in Table 1.

Table 1: Environmental Zone Classification

Category	Description	Examples
E0	Dark landscapes	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Intrinsically dark landscapes	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Low district brightness areas	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	High district brightness areas	Town / City centres with high levels of night-time activity

The criteria shown in Table 1 were utilised to determine the most appropriate Environmental Zone for the development location.

3.2 IMPACT SIGNIFICANCE

The development was assessed for the disturbance and/or nuisance to nearby existing receptors due to artificial lighting.

Light trespass was considered for the relevant Environmental Zone, as previously outlined in Table 1. Obtrusive light limitations for exterior lighting installations, relevant to this assessment, have been determined by the ILP. These are summarised in Table 2.

¹ Lighting in the Countryside; Towards Good Practice, Department for Communities and Local Government, 2005.

Table 2: Obtrusive Light Limitations for Exterior Lighting Installations

Environmental Zones	Light Trespass (into Windows) E_v (lux) ^(a)		Maximum Luminous Intensity (cd)		Maximum Building Luminance (cf/m ²)
	Pre-Curfew	Post-Curfew ^(b)	Pre-Curfew	Post-Curfew ^(b)	
E0	0	0	0	0	0
E1	2	1 ^(b)	2500	0	0
E2	5	1	7500	500	5
E3	10	2	10000	1000	10
E4	25	5	25000	2500	25

NOTE: (a) Vertical Illuminance measured flat at the glazing at the centre of the window.

(b) From public road lighting installations only.

The criteria in Table 2 were utilised to determine the potential for adverse impacts of light trespass at sensitive locations across the development.

4 BASELINE

Existing lighting conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 EXISTING LIGHTING ENVIRONMENT

4.1.1. SURROUNDING AREA

The surrounding area is predominantly fields, sports clubs and school grounds, with residential units adjacent to the East of the site. The site is located on the fringe of a suburban area.

4.1.2. ENVIRONMENTAL ZONE

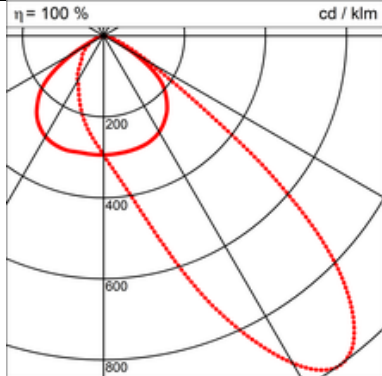
The Surrounding area is classified as category E3 – Medium district brightness areas (Well inhabited rural and urban settlements, small town centres of suburban locations).

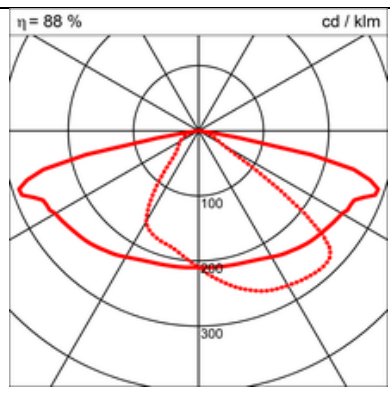
4.2 PROPOSED ARTIFICIAL LIGHTING

Based on the finding of previous sections, Table 3 indicates the proposed forms of artificial light which will be utilised across the proposed development including luminaires which allow for adequate illuminance across the sports areas.

The products specified within Table 3 are examples which are used to determine the required specifications which the final products should mirror. It should be noted that all products will maintain a colour temperature of 2700K (or as close as practically possible) to minimise impacts at any surrounding ecological receptors

Table 3: Proposed Artificial Lighting

Luminaire	Luminaire Data		LDC
1. OPPLE - LEDFloodOly-P Re600-800W-740-AS-LUM (709000083800)			
	LiTG Class	A50	
	CIE Flux Codes	58 94 100 100 100	
	Efficiency	Absolute Photometry	
	System Power	800 W	
	Luminaire Output	150 lm/W	
	System Light Flux	120000 lm	
	Protection Class	Class I	
	Protection Degree	IP 66	
2. Philips – ClearFlood (BVP650 T25_740)			
	LiTG Class	A30	
	CIE Flux Codes	39 73 97 100 88	

	Efficiency	88 %	
	System Power	58 W	
	Luminaire Output	151.7 lm/W	
	System Light Flux	8800 lm	
	Protection Class	-	
	Protection Degree	IP 66	

The proposed Luminaire 1 as detailed in Table 3 is to be located around the outside tennis courts at a height of 8 meters (or as close as practically possible).

Whereas the proposed Luminaire 2 as detailed in Table 3 is to be located under the canopy at a height of 5.4 meters (or as close as practically possible).

The locations of all luminaires are detailed in Appendix II – Parts list, and shown in Figure 3 of Appendix I. These luminaires will provide sufficient light to the sports courts, to conform with Sports England guidelines, without over lighting the area.

The lights will be in use as necessary pre-curfew and switched off when not in use. As standard curfew is set to 23:00hrs although it is anticipated the latest the lights will be in use is 22:30hrs, in line with the club's closing time. The lights will not be in use post-curfew.

4.3 SENSITIVE RECEPTORS

A sensitive receptor is defined as any area which may be affected by changes in lux levels as a result of a development. These could be residential units (Res), schools (Sch) or ecological areas (Eco).

4.3.1. OPERATIONAL PHASE SENSITIVE RECEPTORS

A desk-top study was undertaken in order to identify any potential sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment and are summarised in Table 4 and shown graphically in Figure 2 of Appendix I.

Table 4: Sensitive Receptor Locations

Sensitive Receptor ID	NGR (m)	
	X	Y
Res 1	475734.5	175034.6
Res 2	475764.0	175026.8
Res 3	475750.0	174973.4
Res 4	475495.7	175075.2
Sch 1	475964.9	175007.4
Eco 1	475519.9	175146.6
Eco 2	475571.5	175206.9
Eco 3	475690.1	175174.4

The sensitive receptors identified in Table 4 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience artificial lighting impacts as a result of the proposed development that have not been individually identified above.

5 ASSESSMENT

There is the potential for artificial lighting impacts on sensitive receptors as a result of the operation of the Proposed Development. These are assessed in the following Sections.

5.1 OPERATIONAL PHASE ASSESSMENTS

Additional artificial lighting associated with the operation of the proposed development has the potential to impact upon sensitive receptors either from direct light or light spill. An assessment was therefore undertaken using dispersion modelling in order to quantify potential lux levels at sensitive locations in the vicinity of the site.

Predicted lux levels across the nearby sensitive receptors are summarised in Table 5. Exceedances of 10lx for residential receptors and 0.5lx for ecological receptors are highlighted in **bold**.

Table 5: Modelling Results – Lux Levels

Ecological Receptor	Minimum Lux Levels	Maximum Lux Levels	Average Lux Levels
Res 1	5.0	7.7	6.2
Res 2	2.4	2.7	2.6
Res 3	2.1	3.2	2.7
Res 4	0.07	0.2	0.1
Sch 1	0.1	0.2	0.1
Eco 1	0.03	0.2	0.1
Eco 2	0.09	0.1	0.1
Eco 3	0.4	0.4	0.4

The predicted lighting levels shown in Table 5 indicate that there were no exceedances of 10lx at any of the residential receptors. It should be noted that the selection of 10lx for the residential receptors is based on the pre-curfew limit for obtrusive light guidance from the ILP for the E3 environmental zone classification (as previously discussed in section 3). As such these luminaires must not be used post-curfew and therefore will not impact sensitive receptors post-curfew.

Furthermore, the results shown in Table 5 indicated that there were no exceedances of 0.5lx at any of the ecological receptors when the luminaires were in use. As such, it was considered that these locations do not require any mitigation measures.

Based on the above results of the lighting impact assessment and worse case assumptions used, the site is not considered to significantly impact on sensitive receptors along the site boundary. Artificial lighting impacts from the development are therefore not considered to require any further mitigation and should not be considered a constraint to planning.

Reference should be made to Figure 2 within Appendix I for a graphical representation of operational phase artificial lighting sensitive ecological receptor locations.

6 BEST PRACTICE MEASURES

Due to the nature of the Proposed Development, best practise measures have been followed in this model based on guidance from the ILP

Measure to include:

- The use of luminaries that lack UV elements;
- Luminaires with an angle of light emitted less than 85° to reduce sky glow and glare effect;
- Luminaires with asymmetric optics, to minimise obtrusive light;
- Limitation of illumination on surrounding premises below the maximum values as detailed in Table 2;
- Strict curfew for use and
- Outdoor court lights to be turned off when not in use.

It should be noted that a number of these considerations may also have financial and environmental benefits to the future residence as a result of reduced electricity usage.

7 CONCLUSION

PEC were commissioned by PadelStars Ltd to undertake an Artificial Lighting Impact Assessment in support of a proposed sports pitches at Berkshire County Sports Club, Sonning Lane, Sonning, Reading RG4 6ST.

Modelling was undertaken in order to predict impacts associated with changes in artificial lighting levels at sensitive receptor locations surrounding the site boundary.

The modelling results indicated that there were no exceedances of 10lx pre-curfew at any residential receptors. Furthermore, the results also indicate that there were no exceedances of 0.5lx at any of the ecological areas. Therefore, artificial lighting impacts from the development are not considered to require any further mitigation.

Based on the assessment results, artificial lighting is not considered a constraint to planning consent for the proposed development.

8 ABBREVIATIONS

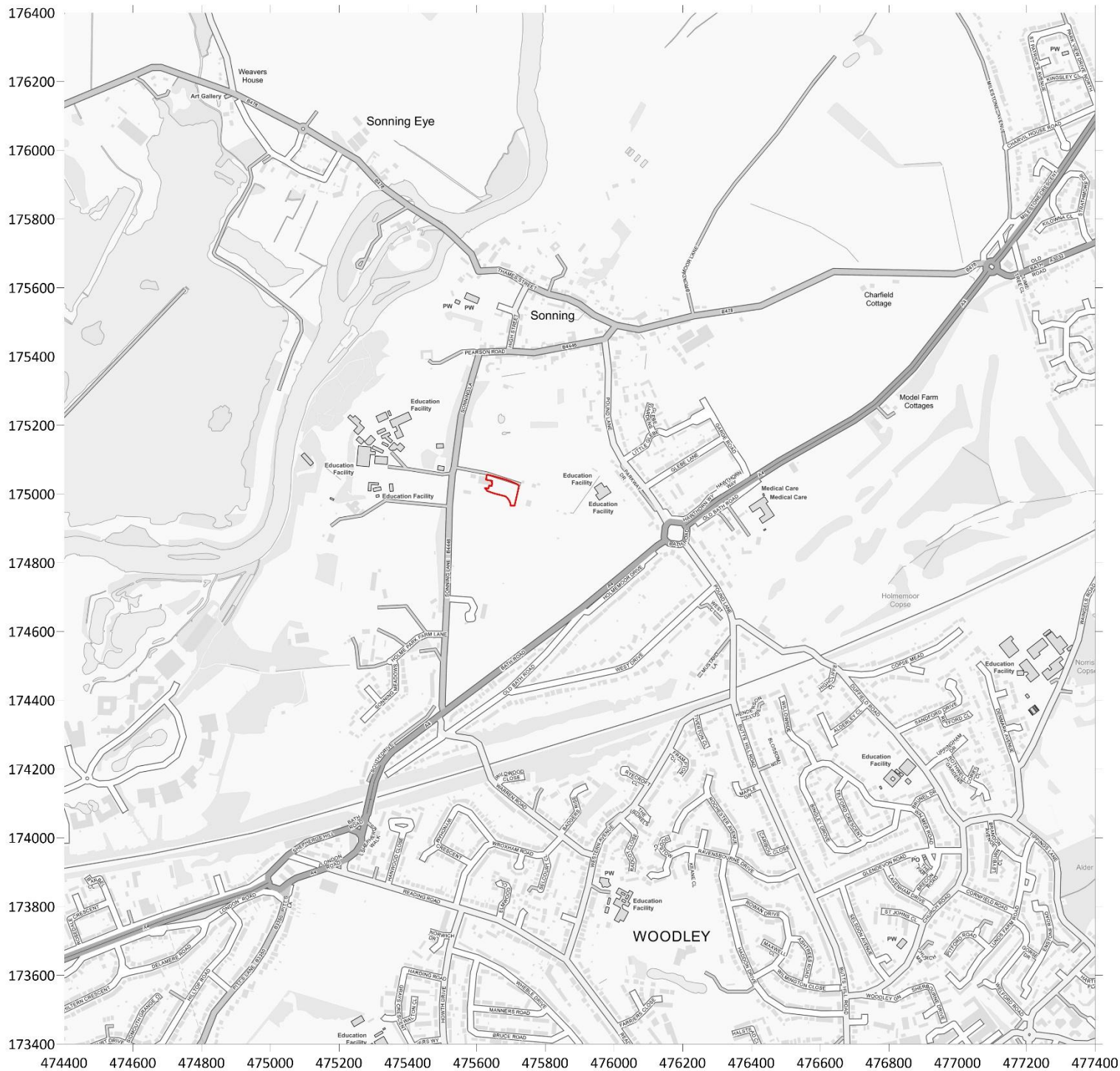
ILP	Institution of Lighting Professionals
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PEC	Planning and Environmental Consultants
WBC	Wokingham Borough Council

PadelStars Ltd
Berkshire County Sports Club, Sonning Lane, Sonning, Reading RG4 6ST
1rL10175
20/12/2024



APPENDIX I - FIGURES

APPENDIX I - FIGURES



Legend

 Site Boundary

Title

Figure 1
Site Location and Context

Project

Berkshire County Sports Club

Project Number

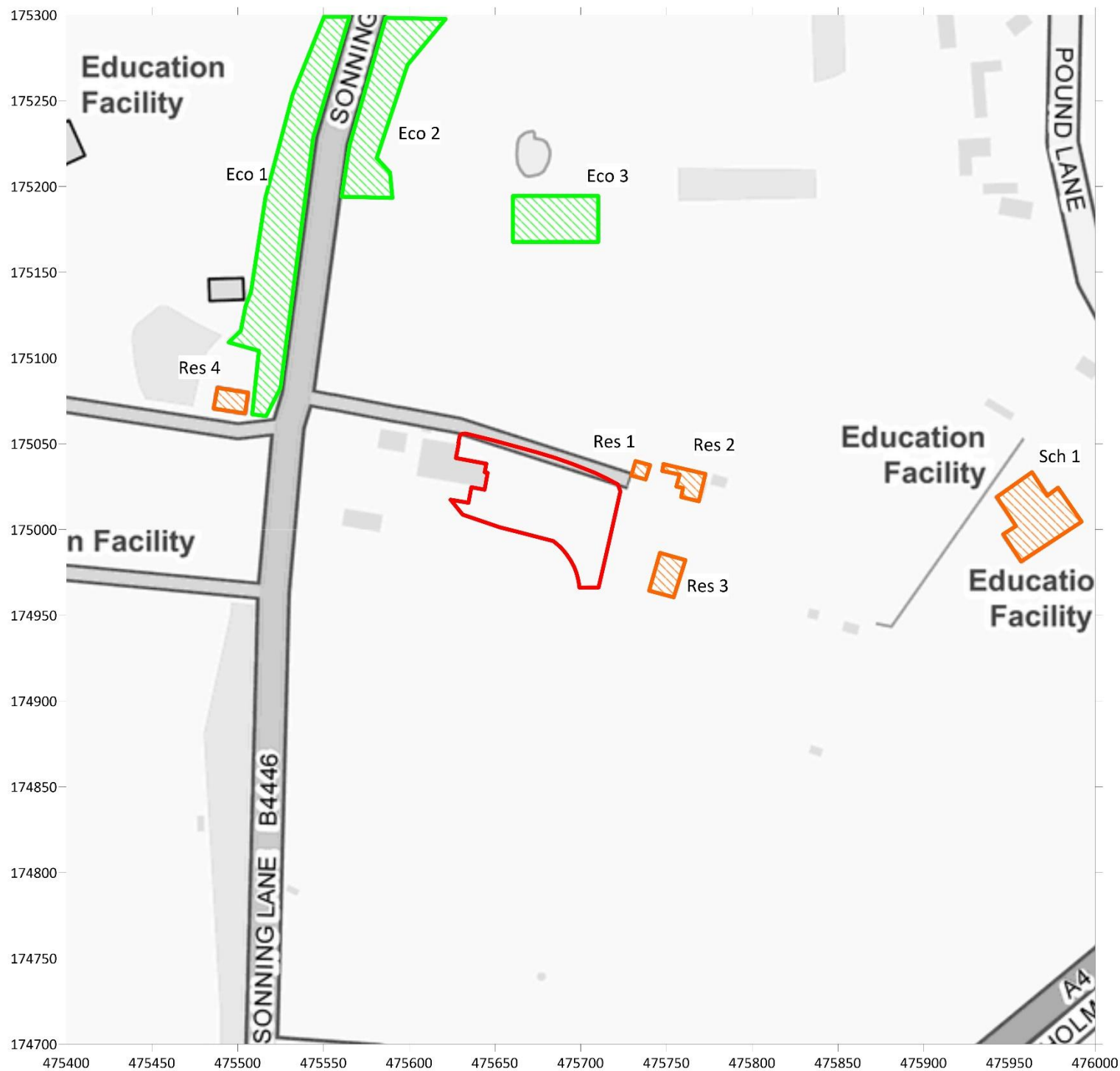
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Legend

-  Site Boundary
-  Residential Sensitive Location
-  Ecological Sensitive Location

Title

Figure 2
Sensitive Receptor Locations

Project

Berkshire County Sports Club

Project Number

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Legend

-  Site Boundary
-  Residential Sensitive Location
-  Luminaire 1
-  Luminaire 2

Title

Figure 3

Luminaire Locations

Project

Berkshire County Sports Club

Project Number

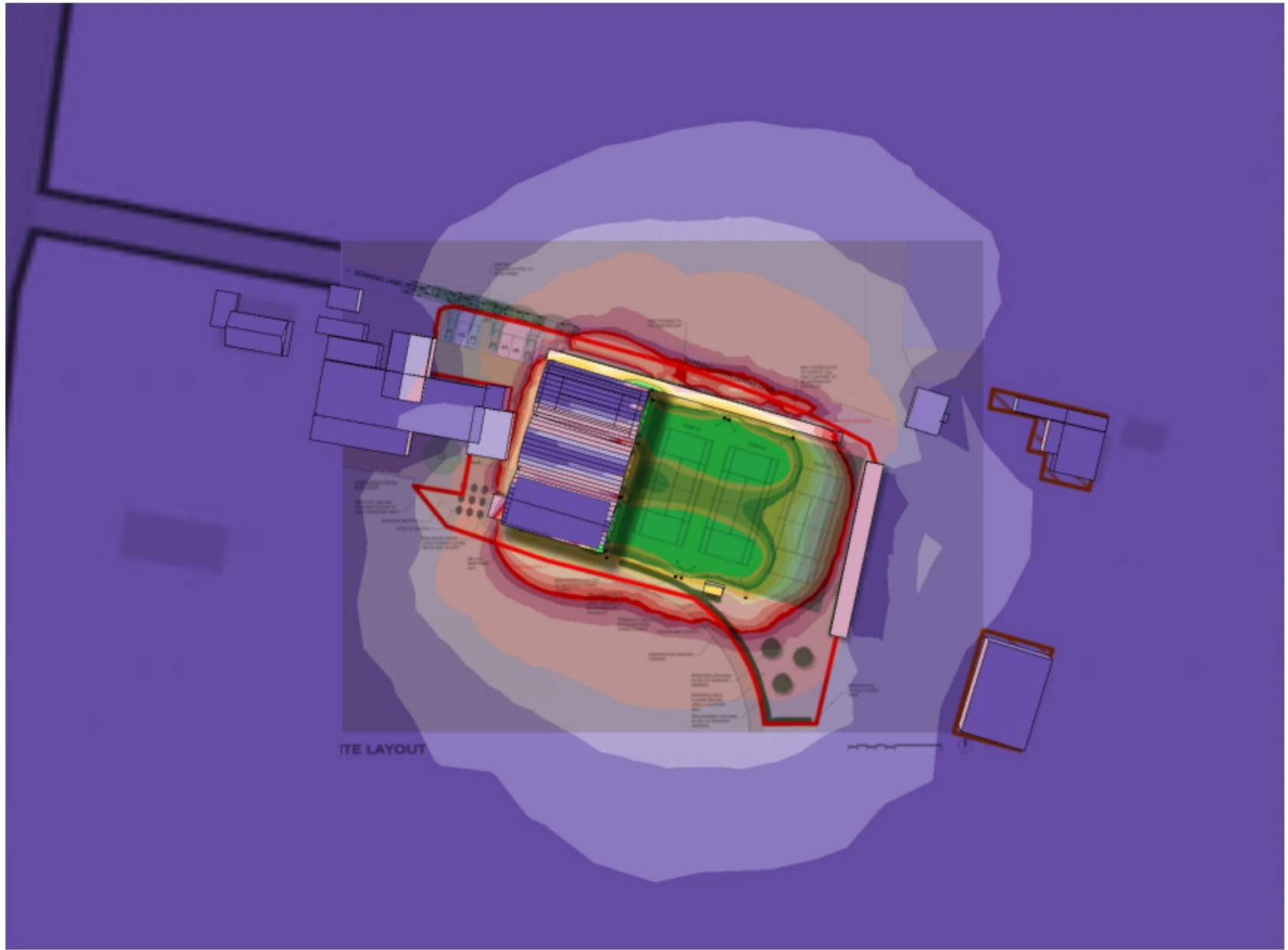
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Title
Figure 4
Predicted Lux Level (0m)

Project
Berkshire County Sports Club

Project Number
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APPENDIX II - PARTS LIST

Type	ID	Company	Product Name	X	Y	Z	Directional Angle (°)	Tilt (°)
L1	1	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475676.319	175035.680	8	185	20
L1	2	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475705.489	175027.808	8	150	20
L1	3	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475695.612	174994.521	8	357	20
L1	4	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475666.727	175002.881	8	325	20
L1	5	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475691.236	175031.952	8	132	20
L1	6	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475681.043	174999.014	8	15	20
L1	7	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475682.269	174998.642	8	310	20
L1	8	OPPLE	LED Flood Oly-P Re600-800W-740-AS-LUM	475692.161	175031.587	8	196	20
L2	9	Philips	ClearFlood	475644.927	175010.098	5.4	265	35
L2	10	Philips	ClearFlood	475665.176	175004.214	5.4	60	35
L2	11	Philips	ClearFlood	475654.722	175043.484	5.4	235	35
L2	12	Philips	ClearFlood	475674.973	175037.798	5.4	95	35
L2	13	Philips	ClearFlood	475651.221	175032.083	5.4	230	35
L2	14	Philips	ClearFlood	475647.818	175020.679	5.4	220	35
L2	15	Philips	ClearFlood	475671.273	175025.895	5.4	100	35
L2	16	Philips	ClearFlood	475668.374	175014.891	5.4	110	35
L2	17	Philips	ClearFlood	475668.579	175015.518	5.4	50	35
L2	18	Philips	ClearFlood	475671.482	175026.821	5.4	40	35
L2	19	Philips	ClearFlood	475648.027	175021.405	5.4	280	35
L2	20	Philips	ClearFlood	475651.527	175032.905	5.4	280	35

Lewis Ellison Technical Director MOcean, MIEEnvSc, MIAQM
KEY EXPERIENCE Lewis is a Technical Director with specialist experience in the air quality sectors. His key capabilities include: • Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors. • Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use. • Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology. • Assessment of Odour Impact from commercial and industrial processes in line with Environment Agency (EA) and IAQM methodologies and guidance • Quantification of Ecological Impacts associated with Nitrogen and Acid Deposition from industrial processes • Production of air quality mitigation strategies for developments throughout the UK.
SELECT PROJECTS SUMMARY Permit Application Support • Elliot Hire Salford • Elliot Hire Wakefield • Elliot Hire Scunthorpe ES Chapters • Lyle Park West, Newham – residential development in close proximity to an active industrial estate. • Deansgate, Manchester – residential multistorey development in the centre of Manchester. • Land West of Stevenage – 1350 residential unit development with the potential to negatively impact local air quality Air Quality • Goulton Street Hull – Outline planning permission for 7 industrial units within Hull • Empire Cinema, Birmingham – Diffusion tube survey and air quality assessment for an assisted living accommodation • Tirrell's Lane, Tenbury Wells – residential assessment in the village of Tenbury Wells. Odour Assessments • Gowanbank, Forfar – Odour survey to support a residential development in close proximity to Gowanbank recycling centre • Squires Close, Pocklington – Odour risk assessment in support of a residential in close proximity to a sewage treatment works • Hawthorn Fields, Rufforth - Odour risk assessment in support of a residential in close proximity to a waste water treatment works Dust Assessment • Liverpool Docks – Construction dust monitoring survey • Lyle Park West – Dust impact assessment from adjacent concrete batching plant • High Street, Burton – Construction dust risk assessment London Experience • Gurnell Leisure Centre – mixed use development including residential, sports and commercial land use • Springfield Village Wandsworth – residential development and extension to the existing hospital building • Evelyn House, Greenwich – residential apartment block Monitoring & Surveying Experience • Liverpool Waters – Frisbee Dust gauge monitoring • Gowanbank, Forfar – Field odour survey “sniff test” • Empire Cinema Birmingham – Diffusion tube survey
QUALIFICATIONS • Masters of Geological Oceanography • Odour Acuity Certified Master of Science